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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,411

01/03/2006

Juergen Weisser

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02/03/2009

REED SMITH, LLP

ATTN: PATENT RECORDS DEPARTMENT

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NEW YORK, NY 10022-7650

EXAMINER

NGUYEN, HUNG D

ART UNIT

PAPER NUMBER

4118

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/563,411	Applicant(s) WEISSER ET AL.	
	Examiner HUNG NGUYEN	Art Unit 4118	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>1/3/06</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This office action is responsive to the amendment filed on 01/03/2006. As directed by the amendment: claims 1-6 have been cancelled and new claims 7-11 have been added. Thus, claims 7-11 are presently pending in this application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 10 rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. It is not sufficiently defined what the step of pretensioning in order to generate additional stresses involve.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 11 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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6. Claim 11 recites the limitation "the workpiece support" in line 2. There is insufficient antecedent basis for this limitation in the claim. It is suggested to amend to --a workpiece support -- or define a workpiece support earlier in the claim.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Allaire et al. (US Pat. 5,776,220) in view of Hauer et al. (US Pat. 6,811,069 B2).

9. Regarding claim 7, Allaire et al. discloses a method for splitting brittle material workpiece through provocation of a separation crack due to stresses occurring as a result of temporal and local application of heat from a laser along a desired splitting line and, following this, a temporal and local removal of heat by means of a coolant (Col. 3, Lines 19-37), comprising the steps of: applying laser radiation 16 (Fig. 1) to form a beam spot 18 (Fig. 1) on the workpiece 10 (Fig. 1), the length b (Fig. 2) of the beam spot 18 (Fig. 2) in the direction of a splitting line being greater than the width a (Fig. 2) of the beam spot perpendicular to the splitting line 20 (Fig. 2); and adjusting the beam spot length depending upon the thermal conductivity of the workpiece and the material thickness of the workpiece that it is as small as necessary for achieving the required temperature gradient for generating the splitting crack in spite of thermal conduction but

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is also as large as possible in order to achieve the fastest possible introduction of heat and, consequently, a high process speed (Col. 2, Lines 32-40).

Allaire et al. does not disclose that the beam spot length is calculated from the following formula: $l = 8 \cdot d \cdot 24 / WLF$, where l is the length of the beam spot, WLF is the thermal conductivity of the ceramic to be split, and d is the thickness of the ceramic workpiece to be split. However, Allaire et al. teaches a method for breaking brittle materials which discloses a formula $V = k \cdot a(b+l)/d$ where V is the rate of relative displacement of the beam spot 18 (Fig. 1) and the material 10 (Fig. 1); k is a proportionality factor dependant on the thermal physical properties of the material and the beam power density; a is the width of the beam spot; b is the length of the beam spot; l is the distance from the rear edge of the beam spot to the front edge of the cool zone; d is the depth of the blind crack. To optimize the cutting cycle for different materials, it is necessary to establish the proper relationship between the major parameters and variables of the cutting process (Col. 4, Lines 38-40). Therefore depending on the parameters known, one can use this formula to calculate the beam spot length by rearranging it: $b = (Vd/ka) - l$. Although Allaire et al. does not teach $8 \cdot d \cdot 24 / WLF$ to determine beam spot length, Allaire et al. teaches a different formula to obtain the same result. Therefore, since the result is the same, it would be obvious to one of ordinary skill in the art to use any formula that provides the beam spot length as claimed, for the purpose of optimizing the cutting process.

Allaire et al. does not disclose that the workpiece is ceramic. However, Hauer et al., teaches a method for cutting flat workpiece made of brittle material, in particular

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glass or ceramic (Col. 1, Lines 5-7). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Allaire et al. to include cutting ceramic as a cutting brittle materials, as taught by Hauer et al., for the purpose of cutting variety of non-metallic materials.

10. Regarding claim 8, Allaire et al. discloses all the claimed features except for no initial crack is generated for initiating the splitting process. However, Hauer et al., teaches a method for the cutting of flat workpieces made from a brittle material without the micro-cracks in the initial scribing process (Col. 1, Lines 14-26; Col. 5, Lines 44-49). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Allaire et al. such that there is no micro-cracks/scribing to the process of separation of the workpiece, as taught by Hauer et al., for the purpose of preventing the particles (from scribing) to deposit on the surface of the workpieces (Col. 1, Lines 19-26).

11. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allaire et al. (US Pat. 5,776,220) in view of Hauer et al. (US Pat. 6,811,069 B2) and further view of Glushchenk (XP-002305391).

12. Regarding claim 9, the combined references disclosed all the claimed features except for the internal stresses of the workpiece along the desired splitting line are determined before the start of the splitting process and the output or the speed is so controlled in a spatially-oriented manner during the splitting process while taking into account the internal stresses that the thermal stresses and the internal stresses along the splitting line, in sum, achieve the breaking stress needed for crack formation.

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However, Glushchenk teaches the process of cutting the glass strip by measuring the temporary normal stress in the glass prior cutting it (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Allaire's method to include measuring the stress of the glass prior cutting it, as taught by Glushchenk, for the purpose of increasing productivity and yielding high quality production (Abstract).

13. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allaire et al. (US Pat. 5,776,220) in view of) in view of Hauer et al. (US Pat. 6,811,069 B2) and further view of Kondratenko (US Pat. 5,609,284).

14. Regarding claim 10, as best understood, the combined references disclosed all the claimed features except for the workpiece is held on a workpiece support accompanied by pretensioning in order to generate additional stresses reinforcing the process stresses. However, Kondratenko teaches preheating (Col. 8, Lines 4-8) the glass on the table, thereby pretensioning to generate additional stress to the workpiece prior to applying the laser to the glass surface (Col. 11, Lines 5-12). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the combined references to preheat the workpiece before applying the laser beam to the surface of the workpiece, as taught by Kondratenko, for the purpose of increasing the cutting speed, accuracy and quality of the edge face of the material.

15. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Allaire et al. (US Pat. 5,776,220) in view of Hauer et al. (US Pat. 6,811,069 B2) and further view of Hoekstra et al. (PG Pub 2003/0024909).

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16. Regarding claim 11, the combined references disclosed all the claimed features except for the workpiece is fixed to the workpiece support, on which the workpiece is also held in the same manner during the splitting process, for measuring the internal stress. However, Hoekstra et al. teaches a laser system 20 (Fig. 2) with the workpiece W (Par. 43, Lines 1-3) and the support table 28a (Fig. 2); and the thermal and stress/strain mechanisms used in the designing a system for separating non-metallic material (Par. 25). The three dimensional stress/strain field relationship within the material is analyzed. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify Allaire et al. to include a support table having a stress/strain mechanism such that the internal stress can be analyzed in the process of separating non-metallic materials, as taught by Hoekstra et al., for the purpose of improving the quality of the cut of the laser system.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Danilov et al. (US Pat. 5,103,073) discloses a device for laser treatment of an object. Stevens (US Pat. 5,622,540) discloses a method for breaking a glass sheet. Ariglio et al. (US Pat. 5,826,772) discloses a method and apparatus for breaking brittle materials.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUNG NGUYEN whose telephone number is (571)270-7828. The examiner can normally be reached on Monday-Friday, 7:30AM-5PM EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Quang Thanh can be reached on (571)272-4982. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Quang D. Thanh/
Supervisory Patent Examiner, Art
Unit 4118

/HUNG NGUYEN/
Examiner, Art Unit 4118